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# New Combinations in *Habranthus* (Amaryllidaceae) in Mexico and Southwestern U.S.A.

*Raymond O. Flagg*

Carolina Biological Supply Company, 2700 York Road, Burlington, North Carolina 27215-3398, U.S.A. rflagg@triad.rr.com

*Gerald L. Smith*

Biology Department, High Point University, University Station, Montlieu Avenue, High Point, North Carolina 27262-3598, U.S.A.

*Alan W. Meerow*

USDA-ARS-SHRS, 13601 Old Cutler Road, Miami, Florida 33158, and Fairchild Tropical Garden, 10901 Old Cutler Road, Miami, Florida 33158, U.S.A.

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**ABSTRACT.** New combinations in *Habranthus* Herb. (Amaryllidaceae) are made for four species that were previously treated as *Zephyranthes* Herb. (*Z. arenicola* Brandegee, *Z. chichimeca* T. M. Howard & S. Ogden, *Z. conzattii* Greenm., and *Z. longifolia* Hemsl.) and that are endemic to Mexico and the southwestern United States: *H. arenicola* (Brandegee) Flagg, G. Lom. Sm. & Meerow, *H. chichimeca* (T. M. Howard & S. Ogden) Flagg, G. Lom. Sm. & Meerow, *H. conzattii* (Greenm.) Flagg, G. Lom. Sm. & Meerow, and *H. longifolius* (Hemsl.) Flagg, G. Lom. Sm. & Meerow. The mature anthers, which are more or less horizontal and usually lunate or U-shaped, readily distinguish *Habranthus* from *Zephyranthes*, in which the mature anthers are vertical and relatively linear.

**Key words:** Amaryllidaceae, *Habranthus*, Mexico, southwestern United States, *Zephyranthes*.

In reviewing specimens of *Habranthus* Herb. and *Zephyranthes* Herb. (Amaryllidaceae) in Mexico and the southwestern United States, we found four species treated as *Zephyranthes* that we are transferring to *Habranthus*. *Habranthus* and *Zephyranthes* are closely allied genera—both bearing the same common name, rain-lilies. Mature anthers, which are more or less horizontal and usually lunate or U-shaped, readily distinguish *Habranthus* from *Zephyranthes*, in which the mature anthers are relatively vertical and linear. Other characteristics distinguishing Mexican members of the two genera are more readily observed in living plants than in herbarium specimens. Flowers of *Habranthus* tend to be nodding with stamens at three or four distinct levels; flowers of *Zephyranthes* tend to be erect to suberect with stamens at two levels with varying degrees of overlapping to non-overlapping of

the anthers. Another floral characteristic that has proven useful in separating taxa of *Zephyranthes* and *Habranthus* is the shape of the young ovary. It is cylindrical, broader at the apex tapering slightly to the base in taxa of *Habranthus*. In contrast, the young ovary is subglobose to globose in taxa of *Zephyranthes*. A notable exception is that in certain *Zephyranthes* taxa, which have at various times been treated in the genus *Cooperia* Herb., the young ovary is cylindrical but not broader at the apex and not tapering slightly to the base (Flagg et al., 2002a, b).

This generic distinction is supported by nuclear ribosomal DNA (nrDNA) ITS sequences studies by Meerow et al. (2000). In Figure 1 of their paper, there is a monophyletic clade that, when carefully evaluated, is determined to be all *Habranthus* taxa as defined by the criteria outlined above. These findings suggest *Habranthus* as a monophyletic group, although the four combinations made here were not part of that study.

**1. *Habranthus arenicola*** (Brandegee) Flagg, G. Lom. Sm. & Meerow, comb. nov. Basionym: *Zephyranthes arenicola* Brandegee, Proc. Calif. Acad. Sci., ser. 2, 2: 205. 1889. *Atamosco arenicola* (Brandegee) Greene, Pittonia 3: 187. 1897. TYPE: Mexico. Baja California: Santa Margarita Island, 2 Mar. 1889, *T. S. Brandegee s.n.* (lectotype, designated here, UC).

**Note.** For the lectotype we selected the only Brandegee collection cited in the protologue that had a flower.

*Selected specimens examined.* MEXICO. **Baja California:** Magdalena Bay, 15 Jan. 1889, *T. S. Brandegee s.n.*

(syntype, UC); Guadalupe, 17 Jan. 1890, *T. S. Brandege s.n.* (UC); head of S branch of Canada de Teojo, vic. of Portezuelo de Peloteado, *A. Carter 4655* (UC); peaks S of Portezuelo de la Cuesta de los Dolores, *A. Carter 4770* (UC); Mesa de San Geronimo, N from Rancho Viejo, *A. Carter 5018* (UC); Turtle Inlet, Magdalena Bay, "type region," *J. T. Howell 10650* (GH); upper slopes, arroyo S of Marquer Bay, Carmen Is., *R. Moran 9195* (MO).

**2. *Habranthus chichimeca*** (T. M. Howard & S. Ogden) Flagg, G. Lom. Sm. & Meerow, comb. nov. Basionym: *Zephyranthes chichimeca* T. M. Howard & S. Ogden, *Herbertia* 46(2): 105–106. 1990 [1991]. TYPE: Mexico. Nuevo León: ca. 25 mi. N of Matehuala, San Luis Potosí, near state line of Nuevo León & San Luis Potosí, June 1986, *T. M. Howard & S. Ogden 86-44* (holotype, MO).

*Selected specimens examined.* MEXICO. **Nuevo León:** Mpio. Zaragoza Camino de la Encantada a la Tinhaja, *L. Hernandez et al. 2760* (TEX). **San Luis Potosí:** ca. 2 km NE of Estación Vanegus, *M. C. Johnston et al. 11095* (TEX). **Tamaulipas:** 38.8 km (24 mi.) N of Tula on 70 before turnoff to Bustamante, *Cowan et al. 3863* (TEX). **Zacatecas:** high desert, 4 mi. SE of Fresnillo, *Waterfall & Wallis 13823* (TEX).

**3. *Habranthus konzattii*** (Greenm.) Flagg, G. Lom. Sm. & Meerow, comb. nov. Basionym: *Zephyranthes konzattii* Greenm., *Proc. Amer. Acad. Arts* 33: 473. 1898. TYPE: Mexico. Oaxaca: Valley of Oaxaca, 1500 m, 19 Apr. 1896, *C. Konzatti 98* (holotype, GH).

*Habranthus oaxacanus* T. M. Howard, *Herbertia* 51: 43–44. 1996, syn. nov. TYPE: Mexico. Oaxaca: 5 km S of Guelatao on Mexico 175, 3000 m, 30 July 1992, *T. M. Howard 92-4* (holotype, MO).

*Note.* Measurements, observations, and location clearly indicate to us that *Habranthus oaxacanus* is the same taxon as *H. konzattii*.

**4. *Habranthus longifolius*** (Hemsl.) Flagg, G. Lom. Sm. & Meerow, comb. nov. Basionym: *Zephyranthes longifolia* Hemsl., *Diagn. Pl. Nov. Mexic.*, Pt. 3, 55, 1880, non *Z. longifolia* Arechav., 1899. *Atamosco longifolia* (Hemsl.) Cockerell, *Canad. Entomol.* 33: 283. 1901. TYPE: U.S.A. New Mexico: 1851–52, *C. Wright 1904* (lectotype, designated here, K; isotypes, GH, MO, UC, US).

*Notes.* We selected *C. Wright 1904* as the lectotype for *Habranthus longifolius* because it is the

first specimen Hemsley cited in the protologue, and Kew is identified as the herbarium in the protologue. The second specimen cited by Hemsley is *Perry & Palmer 870*.

Although *Zephyranthes aurea* S. Watson (*Proc. Amer. Acad. Arts* 18: 161. 1883) is a valid name, it is illegitimate because two of its eight syntypes are types of *Z. longifolia* Hemsl.: *C. Wright 1904* and *C. C. Parry & E. Palmer 870* (cf. McNeill et al., 2006: Art. 52; K. Gandhi, pers. comm.).

*Selected specimens examined.* MEXICO. **Baja California:** San Gorge, *H. S. Gentry 4173* (ARIZ, GH, MO). **Chihuahua:** SW of Chihuahua, *H. LeSueur 568* (ARIZ, F, MO, TEX, UC). **Coahuila:** valley near Azufrota not far from Saltillo, *J. Gregg 491* (GH, MO); Saltillo, *E. Palmer 219* (C, F, GH, MO, NY, UC). **San Luis Potosí:** 22°N lat., *C. C. Parry & E. Palmer 870* (syntype, K; isosyntypes, GH, MO, NY); ex convalli San Luis Potosí, *J. G. Schaffner 540* (GH, K). **Zacatecas:** Cedros Hills, *F. E. Lloyd 124* (GH). U.S.A. **Arizona:** Cochise Co., near Ft. Huachuca, *J. G. Lemmon 2892* (GH, UC); Pima Co., 10 mi. SE of Tucson, *Goodman & Hitchcock 1241* (F, GH, MO, NY, UC). **New Mexico:** Dona Ana Co., mesa near Las Cruces, *E. O. Wooten 141* (GH, MO, NY, UC); Grant Co., near Silver City, *E. L. Greene 455* (GH). **Texas:** Jeff Davis Co., Ft. Davis, 1880, *J. B. Girard s.n.* (GH); Davis Mtns., Goat Canyon, Jones Ranch, 16 July 1936, *L. C. Hinckley s.n.* (ARIZ, GH, NY).

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